ABSTRACT OF THE DISCLOSURE

A hybrid rocket engine and a method for propelling a rocket utilizing a vortex flow field. The flow field includes an outer fluid vortex spiraling toward a closed end of the flow field generating apparatus and an inner fluid vortex substantially concentric with the outer vortex spiraling away from the closed end and toward an outlet opening in which the inner vortex spirals in the same direction as the outer vortex, but in the opposite axial direction. The invention also relates to a rocket propulsion system utilizing the flow field in which the propulsion system includes a combustion chamber with a fuel source and an oxidizer source that deliver the said fuel and said oxidizer to the said outer and inner vortexes in a manner to support a combustion process while flowing along the flow field.